Simulations of Results from Re-Centering Measures and Alternative Models for Calculation of School District Report Card Ratings
June 14, 2010

Introduction and Background Information

The criteria for assigning school and district report card ratings were established based on data from the 1999-2000 school year; the first report card ratings were published in 2000-2001. When the Palmetto Achievement Challenge Tests (PACT) were replaced by the Palmetto Assessments of State Standards (PASS) in 2009, it was necessary to re-center the measures for calculating the elementary and middle school ratings based on the new tests. Recommendations for re-centering the measures and for adding an additional measure for high school report card ratings are currently under review. As a consequence of the re-centering of elementary, middle, and high school report card ratings based on student performance in 2009, the rating measures for school districts are also in need of review and possible updating. The purpose of this report is to propose alternative models for calculating school district absolute report card ratings, to show the results from re-centering the measures used for calculating the ratings based on 2009 performance data, and to simulate the impact of the various proposed models and re-centered measures on the proportions of school districts at each report card absolute rating level. Three questions guided this analysis and report:

1. Should the measures used for calculating school district report card ratings be re-centered on 2009 performance data?
2. Should the 5-year graduation rate become a component of the district ratings?
3. Can we use the same ranges of index values for assigning ratings for assigning rating performance levels as are used for elementary, middle, and high schools?

In January 2010, following the adoption of PASS student performance levels by the Education Oversight Committee (EOC), the indexes for assigning elementary and middle school report card absolute rating performance levels (e.g., Excellent, Good, Average, Below Average, or At Risk) were re-centered based on 2009 PASS performance. The ranges of absolute indexes corresponding to each elementary and middle school rating performance level were also re-centered to reflect the current performance of students tested in grades 3 through 8 (Table 1).

Table 1
Elementary and Middle School Absolute Rating Performance Expectations
Adopted January 2010

Absolute Rating	Range of Absolute Indexes for Each Performance Level
Excellent	3.40 or above
Good	3.18 – 3.39
Average	2.65 – 3.17
Below Average	2.32 – 2.64
At Risk	2.31 or below

In February 2010 the EOC convened a High School Working Group to provide advice on re-centering the components of the high school report card ratings to reflect current performance on existing measures and to recommend the use of an additional measure (the 5-year graduation rate) in the calculation of rating indexes for high schools. The group also gave advice regarding the feasibility of using the same index ranges for assigning school rating performance levels as are used for elementary and middle schools (e.g., Table 1). The recommendations from the group are currently under consideration by the EOC.

School district report card ratings are based on student performance on the state assessments in grades 3 through 8 and on high school state assessment performance and graduation rates. Subsequent to the adoption of re-centered criteria for elementary and middle school report card ratings and the receipt of recommendations from the High School Working Group regarding re-centering the high school ratings, EOC staff have reviewed and analyzed the criteria for school district ratings. The goal of this review and analysis is to calculate the results from re-centering the rating measures based on current (2009) performance data and to propose alternative models for calculating the ratings. The impacts on the numbers and proportions of school districts in each rating category have also been calculated based on simulations using re-centered data and alternative rating models.

School District Report Card Ratings Through 2009

The following measures are currently used for the calculation of indexes for school district report card ratings:

- First-attempt HSAP and high school SC-Alt performance: The percentage of students in the school district taking the High School Assessment Program (HSAP) or the high school SC-Alternate assessment for the first time who passed both the English language arts and mathematics subtests by scoring at the performance level of "2" or higher.
- Percentage passing End of Course tests: The percent of passing scores (70 or higher) on all of the End of Course tests administered in the school district during the school year and subsequent summer session. The end-of-course assessments currently include Algebra I, English I, U.S. History and the Constitution, and Physical Science (and Biology I when the test is reinstated). In June 2007 the EOC adopted the following policies regarding End of Course test results: for the school years 2007-2008, 2008-2009 and 2009-2010, End of Course test scores for courses offered through the Virtual High School and End of Course test scores for courses offered through dual high school and college credit are to be reported with the high school in which the student is enrolled and calculated into the school ratings and in the district's ratings.
- On-time Graduation rate: The percentage of all students (including students with disabilities) enrolled for the first time in grade nine four years prior to the year of the report card who earn a state high school diploma (not GED), adjusted for transfers in and out of the district. Adjustments for students transferring out of the district cannot be made for those students for whom there is not evidence of enrollment in another state diploma granting program (for example, requests for transcripts from another state diploma granting program). Data from students who meet the state diploma requirements as a result of attending summer school and/or successfully passing HSAP in the summer following their senior year will be included in the calculation of

the on-time graduation rate. The on-time graduation rate is also the graduation rate reported for federal accountability purposes.

- State Assessment Performance in Grades 3-8: An index calculated using PASS, End of Course assessment performance, and SC-Alt Assessment performance of district students in grades three through eight using the same mathematical formula as for calculating an absolute rating index for schools enrolling students in grades three through eight. The index is the average performance of all students in the districts in grades 3 through 8 on all subject areas tested, based on a scale of 1 to 5 corresponding to student performance levels (1=Not Met 1; 2=Not Met 2; 3=Met; 4=Exemplary 4; 5=Exemplary 5).

  (Note: the Education Accountability Act was amended in 2006 (Section 59-18-920) to direct that data from students attending a charter school authorized by a local school district are not to be included in the calculation of the local school district ratings. Ratings for charter schools authorized by a local school district are to be reported separately on the school district report card.)

An index representing the current year's performance is calculated based on the measures used for the district rating, and the district Absolute rating is assigned based on the calculated index. The index is based on a 1 to 5 point system. The state assessment measure in the rating is already on the 1 to 5 point scale, and the high school measures are placed on the 1 to 5 point scale based on the ranges of district performance listed in Table 2.

Table 2
High School Components of School District Ratings for 2008-2009 School Year

Criterion	Points Assigned				
	5	**4**	**3**	**2**	**1**
First-attempt HSAP and SC-Alt Passage Rate	92.9% or more	83.1–92.8%	63.7–83.0%	53.9–63.6%	Below 53.9%
End-of-Course Test Results	77.2% or more	65.6–77.1%	42.4–65.5%	30.8–42.3%	Below 30.8%
On-time Graduation Rate	93.6% or more	85.2–93.5%	68.2–85.1%	59.7–68.1%	Below 59.7%

To calculate the index, the point weights for each component of the district rating are multiplied by the weights listed in Table 3 and the products are summed.

Table 3
Weights for Components of District Absolute Ratings, 2008-2009 School Year

District Rating Component	Weight for Calculating Rating
Elementary and Middle School Component	
PASS, SC-Alt and middle school End of Course results, Grades 3-8	60%
High School Components:	
On-time Graduation Rate	30%
HSAP First Attempt Passage Rate	5%
End-of-Course Test Results	5%
Total	100%

The resulting index is rounded to the nearest one-tenth of a point and compared to the values in Table 4 to determine the Absolute rating level for the district for that year. For example, an index of 3.4 on the 5-point scale would correspond to a rating of "Good" in 2009.

Table 4
District Absolute Rating Criteria, 2008-2009 School Year

Range of Indexes Corresponding to Absolute Rating				
Excellent	**Good**	**Average**	**Below Average**	**At Risk**
3.9 and above	3.5–3.8	3.1–3.4	2.7–3.0	Below 2.7

The distribution of school district Absolute ratings in 2009 based on the point weights in Table 2 and the index criteria in Table 4 is listed in Table 5.

Table 5
School District Absolute Ratings in 2008-2009 School Year

Rating Level	Number (%) of Districts
Excellent	1 (1.2)
Good	0 (0.0)
Average	24 (28.2)
Below Average	39 (45.9)
At Risk	21 (24.7)
Total	85 (100)

Re-centered Measures and Alternative Rating Models

The re-centering of the data based on 2009 performance and the use of alternative models for calculating the ratings result in changes to the values listed in Tables 2 through 4 to reflect the re-centering and changes to the outcomes listed in Table 5 based on the results of calculating simulations of the ratings using the various models and re-centered measures.

In addition to the currently used measures (state assessments; on-time graduation rate; HSAP; end-of-course tests), two of the alternative models for district report card ratings include the use of a new measure, the 5-year graduation rate.

- 5-year Graduation rate: In April 2008 the EOC adopted recommendations from an advisory panel regarding goals for graduation rates, the collection of graduation rate data, and reporting graduation. The recommendations called for the reporting and inclusion in the accountability system of the currently used on-time graduation rate and a 5-year graduation rate including students enrolled in the school or district for an additional year. The 5-year graduation rate for the current year represents an update to the on-time graduation rate of the students in the previous year's graduating class. For example, if a school had 100 students in the cohort of students in the graduating class of 2008 (the denominator) and 80 of those students received high school diplomas in 2008 (the numerator), its on-time graduation rate would be 80% (e.g., [(80/100)*100]). If 10 of the 20 students in the cohort who did not graduate in 2008 stayed in school and received high school diplomas in 2009, the 2009 5-year graduation rate for the cohort would be 90% (e.g., [((80+10)/100)*100]).

Data for calculating the 5-year graduation rate were collected from school districts by the SC Department of Education in 2009. The data were based on the cohort of students who would have graduated in 2008 (e.g., students who first enrolled in grade 9 in Fall 2004). This cohort of students formed the denominator for the calculation of the 2008 on-time graduation rate. The numerator for the 2008 on-time graduation rate was the number of students who received state high school diplomas in the Spring or Summer of 2008. In 2009 districts reported the number of students from the 2008 graduation cohort who received state high school diplomas in 2009 (e.g., students whose diplomas were earned in 5 rather than 4 years). The additional students receiving diplomas in 2009 were added to the number who received diplomas in 2008 to form the numerator for the 5-year graduation rate; the denominator remained the same as that used for calculating the 2008 graduation rate.

Some school districts did not report 5-year graduation rates for 2009. This measure had not been collected in previous years and it is expected that schools and school districts will be able to report the data by the 2010-2011 school year. Data for the simulations were based on the information received from 51 of the 85 school districts which received report card ratings in 2009.

Re-centering the measures used for the simulations is based on calculating the means and standard deviations of the district values for each of the measures used for calculating the rating indexes. These statistics are reported in Table 6.

Table 6
Statistics for Components of District Absolute Rating Simulations

Rating Component	Number of Districts	2009 Mean	2009 Standard Deviation	2009 Minimum	2009 Maximum
High School Components					
On-Time Graduation Rate	85	74.35	7.1697	54.0	90.0
1st Attempt HSAP Performance	85	72.62	9.7017	36.9	94.6
End-of-Course Test Performance	85	55.59	12.4810	26.8	84.1
5-Year Graduation Rate	51*	78.72	7.3453	65.5	95.2
Elementary/Middle School Component					
State Assessment Results (on 1 – 5 point scale)	85	2.84	0.3387	1.99	3.65

* 5-year graduation rate data were available for 51 school districts in 2009.

The state assessment component of the ratings does not need to be re-centered because it is based on 2009 performance data and is already reported on the 1 to 5 point scale used for calculating the ratings. The high school components reported in Table 2 were based on 2005 data, so the high school components need to be re-centered. In June 2009 the EOC adopted the working assumption that the middle rating (Average) would include the mean of the distribution, so, in parallel, the range of values for assigning 3 points (the middle of the 1 to 5 point distribution) to each high school component is centered around the mean listed in Table 6. The cut points for 2 points and 4 points are determined by subtracting from the mean or adding to the mean, respectively, a portion of the standard deviation for the measure. Two portions of the standard deviation (SD) were used for proposed re-centered ranges for assigning point weights for the high school component: 0.5 SD and 0.75 SD. The results of those re-centered ranges for assigning point weights for the high school components of the district ratings are listed in Table 7 (0.5 SD) and Table 8 (0.75 SD). (Note that the index values corresponding to 5 points for on-time graduation rate and 5-year graduation rate have been selected to reflect the state on-time graduation rate goal of 88.3%.)

Table 7
Components of District Absolute Rating Simulations
Performance Requirements for Point Weights Re-Centered on 2009 Performance
High School Point Weights Based on Intervals of 0.5 Standard Deviation From Means

Component	5 Points	4 Points	3 Points	2 Points	1 Point
On-time Graduation Rate	88.3% or more	77.9%-88.2%	70.8%-77.8%	67.2%-70.7%	67.1% or less
1st Attempt HSAP	82.3% or more	77.5%-82.2%	67.8%-77.4%	62.9%-67.7%	62.8% or less
End-of-Course Tests	68.1% or more	61.8%-68.0%	49.4%-61.7%	43.1%-49.3%	43.0% or less
5-year Graduation Rate	91.2% or more	82.4%-91.1%	75.1%-82.3%	71.4%-75.0%	71.3% or less
State Assessment Performance in Grades 3 through 8	The index for state assessment performance for all students in the district across all subjects is calculated as the mean of a scale which runs from 1 to 5 points.				

Table 8
Components of District Absolute Rating Simulations
Performance Requirements for Point Weights Re-Centered on 2009 Performance
High School Point Weights Based on Intervals of 0.75 Standard Deviation From Means

Component	5 Points	4 Points	3 Points	2 Points	1 Point
On-time Graduation Rate	88.3% or more	79.7%-88.2%	69.0%-79.6%	63.6%-68.9%	63.5% or less
1st Attempt HSAP	87.2% or more	79.9%-87.1%	65.3%-79.8%	58.1%-65.2%	58.0% or less
End-of-Course Tests	74.3% or more	65.0%-74.2%	46.2%-64.9%	36.9%-46.1%	36.8% or less
5-year Graduation Rate	95.2% or more	84.2%-95.1%	73.2%-84.1%	67.7%-73.1%	67.6% or less
State Assessment Performance in Grades 3 through 8	The index for state assessment performance for all students in the district across all subjects is calculated as the mean of a scale which runs from 1 to 5 points.				

The simulated district Absolute rating indexes are based on the sum of the weighted points for a district based on Table 7 (0.5 SD simulation) or Table 8 (0.75 SD simulation). The choice of the various components used to calculate the simulated district ratings and the weighting of the components of the rating was based on the three rating models outlined in Table 9.

Table 9
Models for Simulations of District Absolute Ratings

Model	Rating Components	Weighting of Component in Absolute Index Calculation
Model 1 (Current model for district ratings)	State Assessment Results, 3-8	60%
	On-time Graduation Rate	30%
	1st Attempt HSAP	5%
	End-of-Course Tests	5%
Model 2	State Assessment Results, 3-8	50%
	On-time Graduation Rate	30%
	1st Attempt HSAP	5%
	End-of-Course Tests	5%
	5-year Graduation Rate	10%
Model 3	State Assessment Results, 3-8	60%
	On-time Graduation Rate	30%
	5-year Graduation Rate	10%

Model 1 is the model currently used for calculating district ratings. The simulations reported here are based on the results from using Model 1 with re-centered point values using 0.5 SD and re-centered point values using 0.75 SD.

Model 2 includes all of the components currently used for calculating district ratings plus the 5-year graduation rate. The weightings of the components of the model are also changed in Model 2, with state assessment results in grades 3-8 weighted 50% and 5-year graduation rate weighted 10%. The simulations reported here are based on the results from using Model 2 with re-centered point values using 0.5 SD and re-centered point values using 0.75 SD.

Model 3 includes the 5-year graduation rate but does not include 1st attempt HSAP or end-of-course test results. State assessment results in Model 3 are weighted 60% and the two graduation rate measures collectively are weighted 40%. The simulations reported here are based on the results from using Model 3 with re-centered point values using 0.5 SD and re-centered point values using 0.75 SD.

Statistics for the simulated indexes based on each model using re-centered point weights based on 0.5 SD or 0.75 SD are reported in Table 10. The simulations were based on data from the 51 school districts which reported 5-year graduation rates in 2009; data from the remaining 34 districts which received report card ratings in 2009 were incomplete and their indexes could not be simulated.

Table 10
Statistics for Absolute Indexes from Simulated Absolute Ratings Model 1, 2, and 3 Point Weights for High School Components Based on 0.5 and 0.75 Standard Deviations
Simulations Based on Data from 51 Districts Reporting 5-year Graduation Rates in 2009

Model	Number of Districts	Mean	Standard Deviation	Minimum	Maximum
Model 1, 0.5SD Point Weights	51	2.96	0.4887	2.01	4.19
Model 1, 0.75SD Point Weights	51	2.95	0.3987	2.09	4.19
Model 2, 0.5SD Point Weights	51	2.95	0.5295	1.89	4.33
Model 2, 0.75SD Point Weights	51	2.95	0.4178	1.94	4.23
Model 3, 0.5SD Point Weights	51	2.92	0.4796	1.94	4.19
Model 3, 0.75SD Point Weights	51	2.92	0.3965	1.94	4.09

Mean district indexes for the models ranged from 2.92 to 2.96 and standard deviations ranged from 0.3965 to 0.5295. Minimum indexes ranged from 1.89 to 2.09, and maximum indexes ranged from 4.09 to 4.33. To simulate the distribution of ratings based on the various models and re-centered point weights, each district's index was compared to the range of indexes in Table 11 and assigned a rating level based on the table. Note that Table 11 is the same as Table 1, the ranges for Absolute rating indexes adopted in January 2010 for assigning ratings to elementary and middle schools.

Table 11
Elementary and Middle School Absolute Rating Performance Expectations Adopted January 2010
Ratings Criteria Used for Simulations of Alternative District Rating Models

Absolute Rating	Range of Absolute Indexes for Each Performance Level
Excellent	3.40 or above
Good	3.18 – 3.39
Average	2.65 – 3.17
Below Average	2.32 – 2.64
At Risk	2.31 or below

The distributions of the simulated ratings based on Models 1, 2, and 3, and using re-centered point values based on 0.5 SD or 0.75 SD are reported in Table 12. To help with comparisons of the simulated results with actual 2009 performance, the distributions

of 2009 Absolute ratings for the 51 districts whose data were used for the simulations are also reported in Table 12. The distribution of ratings for 2009 for all 85 school districts is also reported in Table 12. The distributions of ratings for all 85 districts and for the 51 districts whose data were used for the simulations are similar, although the proportion of all 85 districts rated At Risk is somewhat higher than among the 51 districts and the proportion of the 51 districts rated Below Average is somewhat higher than among all 85 districts.

Table 12
Simulations of District Absolute Ratings Based on Models 1, 2, and 3
Districts Having Reported 5-Year Graduation Rates Only

Model 1					
Rating	Model 1 (0.5 SD Point Weights) No. (%)	Model 1 (0.75 SD Point Weights) No. (%)	*Actual 2009 Ratings for 51 Districts No. (%)*		*Actual 2009 Ratings for All 85 Districts No. (%)*
Excellent	8 (15.7)	5 (9.8)	*1 (2.0)*		*1 (1.2)*
Good	13 (25.5)	9 (17.6)	*0 (0.0)*		*0 (0.0)*
Average	19 (37.3)	25 (49.0)	*13 (25.5)*		*24 (28.2)*
Below Average	3 (5.9)	9 (17.6)	*27 (52.9)*		*39 (45.9)*
At Risk	8 (15.7)	3 (5.9)	*10 (19.6)*		*21 (24.7)*
Totals	51 (100.1)	51 (99.9)	*51 (100)*		*85 (100)*
Model 2					
Rating	Model 2 (0.5 SD Point Weights) No. (%)	Model 2 (0.75 SD Point Weights) No. (%)	*Actual 2009 Ratings for 51 Districts No. (%)*		*Actual 2009 Ratings for All 85 Districts No. (%)*
Excellent	9 (17.6)	5 (9.8)	*1 (2.0)*		*1 (1.2)*
Good	13 (25.5)	10 (19.6)	*0 (0.0)*		*0 (0.0)*
Average	16 (31.4)	25 (49.0)	*13 (25.5)*		*24 (28.2)*
Below Average	6 (11.8)	8 (15.7)	*27 (52.9)*		*39 (45.9)*
At Risk	7 (13.7)	3 (5.9)	*10 (19.6)*		*21 (24.7)*
Totals	51 (100)	51 (100)	*51 (100)*		*85 (100)*
Model 3					
Rating	Model 3 (0.5 SD Point Weights) No. (%)	Model 3 (0.75 SD Point Weights) No. (%)	*Actual 2009 Ratings for 51 Districts No. (%)*		*Actual 2009 Ratings for All 85 Districts No. (%)*
Excellent	6 (11.8)	4 (7.8)	*1 (2.0)*		*1 (1.2)*
Good	12 (23.5)	8 (15.7)	*0 (0.0)*		*0 (0.0)*
Average	19 (37.3)	29 (56.9)	*13 (25.5)*		*24 (28.2)*
Below Average	7 (13.7)	7 (13.7)	*27 (52.9)*		*39 (45.9)*
At Risk	7 (13.7)	3 (5.9)	*10 (19.6)*		*21 (24.7)*
Totals	51 (100)	51 (100)	*51 (100)*		*85 (100)*

Additional Considerations Regarding the Transition to New Ratings Criteria

Should re-centering of the data and/or a new model for calculating school district ratings be adopted, several issues should be considered:

1. If a new model including 5-year graduation rates is adopted, it can be used for calculating district ratings no earlier than the 2010-2011 school year because 5-year graduation rate data from all school districts were not collected in the 2009-2010 school year.
2. Since re-centered ratings criteria were applied beginning with the 2009 ratings for elementary and middle schools and consideration is being made to apply re-centered criteria for the high school ratings for 2009-2010, if re-centered criteria for district ratings are adopted consideration may also be made to apply the re-centered values to calculating the 2009-2010 district ratings. Model 1 in this report is the same model as will be used for calculating the 2009-2010 district ratings; unless re-centered criteria are used, the 2009-2010 district ratings would need to be based on the criteria used for 2008-2009 ratings, as described in Tables 2-5 above.
3. District Growth ratings are based on differences between the district high school components for Absolute ratings for the current and previous years and on longitudinal student improvement on the state assessments in grades 3 through 8, recalculated to include all students who were enrolled in the school district by the 45th day of the current school year. For the 2009-2010 school year, the state assessment component of the district Growth rating will be based on 2010 PASS performance compared to 2009 PASS performance. The high school components of the district rating in 2009-2010 are the same as the high school components in 2008-2009, so the 2009-2010 district Growth ratings can be based on the state assessment and high school criteria used for the 2009 ratings.
4. Assuming that a new rating model including 5-year graduation rates is adopted, the district Growth rating for 2010-2011 cannot be calculated using the new criteria because the 5-year graduation rate data are not available for the 2009-2010 school year. In this case the 2010-2011 data can be recalculated based on re-centered criteria used for the 2009-2010 ratings to obtain Growth ratings.